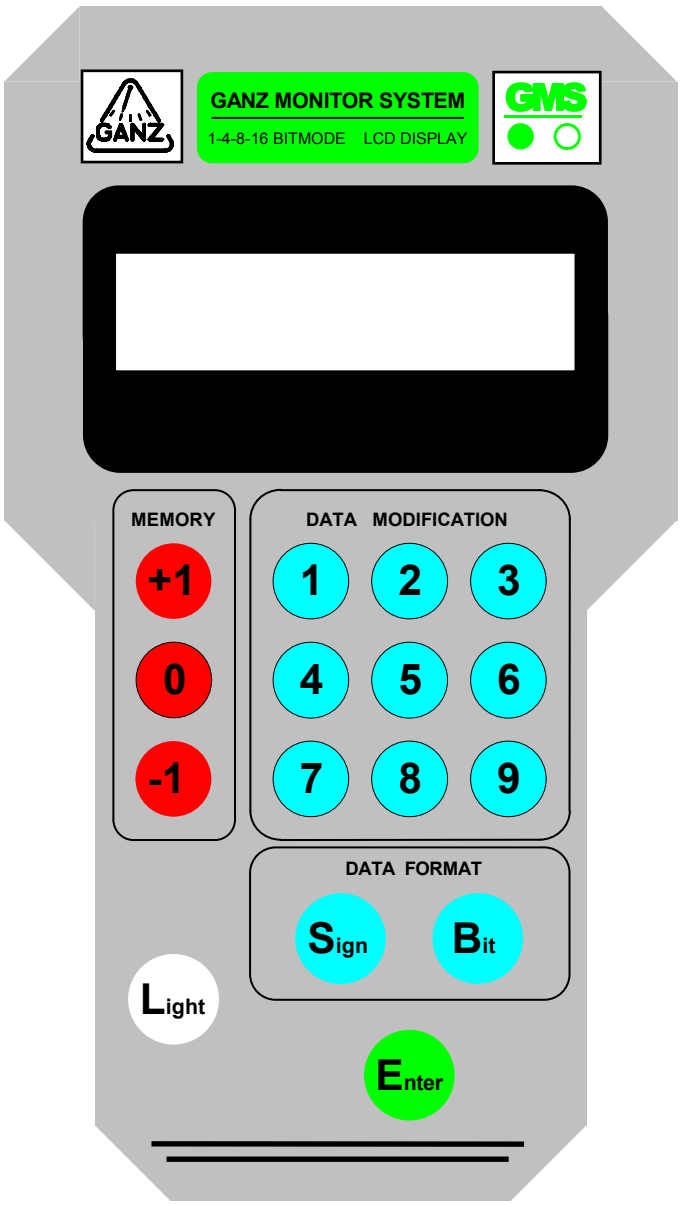
GANZ MONITOR TYPE SM16

TECHNICAL DESCRIPTION & USER'S MANUAL (Version: 9)



The Monitor Unit is applicable to test and set instruments with GMS (Ganz Monitor System) logo made by **Ganz Instruments Ltd** by connecting. The Monitor with its LCD panel and keyboard makes possible the writing and reading of the 255 memory cells of the instrument connected. The functions of the independent memory cells are different to type to type, these are in the GMS description given with the individual instruments.

The Monitor is a portable instrument on batteries. The use of every individual Monitor is bound to a unique PIN (Personal Identification Number) code (max. 5 digits), which must be typed in first, without knowing of it nor writing neither reading of data is possible. In case of writing or modification of data the instrument on test the serial number of the Monitor will be saved to a memory cell automatically. With the reading of this number can the Monitor and/or the test person to be identified.

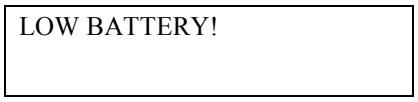
The independent memory cells of an instruments working within the GMS system can be accessed by only a separate Product Code (which depends on the instrument's type) but not by the PIN code. This Product Code is not public because with the help of it can be modify parameters set by the producer which are not permitted for the User.

How to put the Monitor to operation:

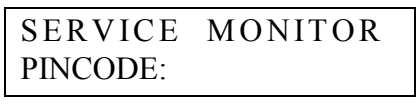
The Monitor goes automatically on when the test cords are plugged to the GMS-connector of the instrument on test. A short beep sounds and on the LCD-panel the Monitor's serial number is shown.

The back-light of the LCD-panel can be switched on/off by the **Light** button. It can be used continously, but this usage shortens the lifetime of the batteries.

When **Enter** is pressed once, the Monitor controls the voltage of the batteries. If it is too low, the low battery warning is shown on the display and a short beep sounds. That time the batteries must be instantly renewed for correct working by unscrewing the backplate. If the batteries are right, no warning is shown.



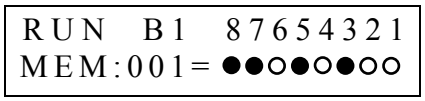
At the second pressing of the **Enter** button the Monitor needs the individual PIN code. That must be given by the numbered buttons and then press **Enter**. If the code is uncorrectly typed, an **Error!** warning is shown on the display and a short beep sounds, afterwards the PIN code must be newly given.

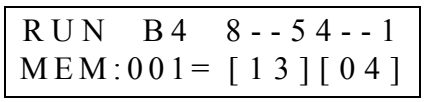


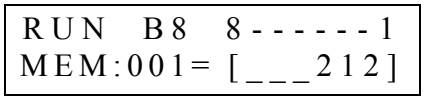
After the right PIN code was given, the Monitor contacts with the instrument connected. It takes a couple of seconds, until then WAIT FOR CONTACT is shown on the display.

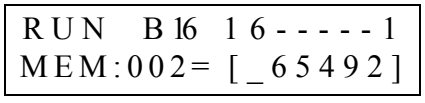
If the contact was made, the Monitor displays the type and identification number of the instrument connected. This identification number is set by the producer and cannot be changed by no way later.

By pressing **Enter** **RUN**-mode can be started, that means the reading of the memory cells (**MEM**) of the instrument connected. At start the content of the memory cell **MEM:001** is shown on the display in 1-bit (**B1**) form. In the data field behind the = sign the displaying of the data is shown continously. At every data transfer an asterisk flickers after **RUN** and a beep sounds. Now the content of the data field will be refreshed. The rate of the reading can changed from a couple of tenth of a second to one or two seconds, this is determined from the instrument connected. When in **RUN**-mode, a return to displaying of the type/ID number of the instrument connected can be caused by pressing **Enter**.









Data forms:

The form of the data displayed will be also determined by the instrument connected. The Monitor can display the data read in four forms:

1-bit (**B1**): data is shown by bit ○ and ● signs,
4-bit (**B4**): data is shown as two 4-bit decimal number,
8-bit (**B8**): data is shown as one 8-bit decimal number,
16-bit (**B16**): data is shown as one 16-bit decimal number.

These could be changed by pressing the **Bit** button on the order m.a., but one or more steps can left out depending on the forms used by the instrument on test.

When the 16-bit (**B16**) form is used, the added content of two memory cells is shown in the same time, this of the displayed one and the next after that (**MEM+1**). Therefore at this form only the content of the even memory cells can be read, in case of odd memory cells on the data field of the display the sign 'No data' (--------) is shown. The same 'No data' sign is shown by reading such memory cells, which ones could not be read with PIN code (but only by Product Code).

At the 8-bit (**B8**) and 16-bit (**B16**) forms the signed mode display can be choosen by pressing the **SIGN** button. Now on the display the 2nd complement of the numerical data read is shown and the sign is also displayed.

```
RUN   B16  16-----1
MEM:001= [------]
```

```
RUN   B8   8------1
MEM:001= [__-044]
```

Search of memory cells:

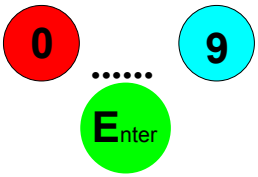
The memory cell can assigned on two ways.

In **RUN**-mode the number of the cell to be read can be stepped by one by pressing the **+1** and **-1** buttons within the valid range (000 ... 255). At change the **MEM** number displayed alters and on the data field 'No data' sign (--------) is shown. The actual data is shown in the data field after the next reading only (if it is a cell saved by PIN code).

```
RUN   B8   8------1
MEM:002= [__-127]
```

```
STOP  B8   8------1
MEM:002= [------]
```

An optional number can writed in the memory field (**MEM**), but for that the reading procedure (**RUN**) must be stopped. This can be made by pressing **0** button. Now instead of **RUN** shows **STOP**, on the data field the sign 'No data' (--------) is displayed, the number of the memory cell flickers. After that the memory field can be rewrited from right to left by pressing the number buttons, to be closed by pressing **Enter**. At typing of false numbers **Err** appears on the display and a short beep sounds, the memory field still flickers. After writing of a valid (000 ... 255) number the Monitor comes into **RUN**-mode, the memory field won't flicker anymore and at the next rea-ding the actual data displays in the data field only (if it is a cell saved by PIN code).




```
RUN   B8   8------1
MEM:255= [__+000]
```

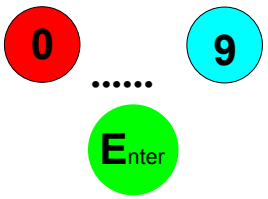
Writing of new data, modification of data:

The content of each individual memory cell can be modified in every display mode. It can be done by pressing one of the buttons **1 ... 9**. Now the reading procedure stops, instead of **RUN** displays **STOP** and the data field flickers with the value shown before. In case of 1-bit (**B1**) form the individual bits can be changed by the number buttons (**1 ... 8**) above them, in other forms (**B4**, **B8**, **B16**) the old value can be modified from right to left. In 4-bit (**B4**) form the lower (4--1) and the upper (8--5) digits can be changed one by one depending that the **RUN** mode was stopped by the buttons **1 ... 4** or **5 ... 8**. In 8-bit (**B8**) and 16-bit (**B16**) form the modification can happen by the buttons **+1** or **-1**, there the old value can be stepped one by one within the value range responding to the form. By continous pressing of the buttons the procedure can be speeded up. In case of displaying the numbers with their signs, the modification of the sign can be made with **Sign** button.

```
STOP  B8   8------1
MEM:255= [__+000]
```

```
STOP  B8   8------1
MEM:255= [__-001]
```

The modification can be cancelled while writing data by pressing the **Bit** button, then the monitor returns into **RUN**-mode without modifying the earlier data. The writing of new data must be closed by pressing **Enter**. In case of uncorrect numbers for a short time **Error!** displayed and a short beep sounds and the monitor returns to **RUN**-mode without modifying the earlier data.



The valid number ranges in the display modes are:
1-bit (**B1**): ○ sign for logical level L ● sign for logical level H,
4-bit (**B4**): 00 ... 15,
8-bit (**B8**): 000 ... 255, resp. -127 ... +127,
16-bit (**B16**): 00000 ... 65535, resp. -32767 ... +32767

In case of a valid value the Monitor writes the new value displayed after the first data transfer after returning into **RUN**-mode to the instrument connected, then re-reading writes back to the LCD-display. Not all the memory cells of the individual instruments are writables, there are read-only ones. In that case the re-read value remains the earlier one in spite of overwriting. Which memory cells are writable or read-only at which instrument, is in the content of the GMS description of the instrument together with the functions.

```
RUN  B8  8------1
MEM:255= [__-213]
```

```
CONNECTION READY
NUMBER  XXX / XXXXX
```

GMS descriptions of the instruments:

The GMS description of the instruments is a list containing the content of the individual memory cells with interpretation in text of the figures of the LCD display, their meaning and that which display mode (**B1**, **B4**, **B8** or **B16**) is to set for the interpretability of the data.

Examples:

B8	8 - - - - - - 1
MEM:001=	[_ _ _ # # #]

Valid Network Address. (for network interface)

B16	1 6 - - - - - 1
MEM:056=	[_ # # # # #]

SIGN
Ch1 output 1 off value. (-9999 ... +9999)
This number is compared to value of display. If the displayed value is step over this off value, output goes off state.

B1	8	7	6	5	4	3	2	1
MEM:016=					#	#	#	#

Place of decimal point on Ch1 display from right side (LSB)
Ch1 sign on display: ○ : disable ● : enable

B16	1 6 - - - - - 1
MEM:094=	[_ # # # # #]

Only readable memory cell.

Serial number of last Monitor which change content any memory cell of instrument.

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